DOCUMENT RESUME

ED 280 862 TM 870 189

AUTHOR	Thompson, Bruce; Borrello, Gloria M.
TITLE	Comparisons of Factors Extracted from the Correlation versus the Covariance Matrix: An Example Using the Love Relationships Scale.
PUB DATE	29 Jan 87
NOTE	35p.; Paper presented at the Annual Meeting of the Southwest Educational Research Association (Dallas, TX, January 29-31, 1987).
PUB TYPE	Reports - Research/Technical (143) -- Speeches/Conference Papers (150)
EDRS PRICE	MF01/PC02 Plus Postage.
DESCRIPTORS	Adults; *Analysis of Covariance; Attitude Measures; *Correlation; Error of Measurement; *Factor Analysis; *Factor Structure; Mathematical Models; Matrices; Scores; Statistical Distributions; *Test Items; *Test Theory
IDENTIFIERS	*Correlation Matrices; Love Relationships Scale; Residuals (Statistics)

ABSTRACT

Attitude measures frequently produce distributions of item scores that attenuate interitem correlations and thus also distort findings regarding the factor structure underlying the items. An actual data set involving 260 adult subjects' responses to 55 items on the Love Relationships Scale is employed to illustrate empirical methods for identifying such items during test construction or test validation. Two methods for identifying these items are proposed. The first method involves the use of "best fit" factor rotation; the second method involves the comparison of "reproduced" correlation matrices computed from two structure matrices. It is noted that examination of item descriptive statistics may not successfully substitute for an empirical method for identifying potentially troublesome items. An appendix contains tabulated data. (Author/JAZ)

seralove.rno 1/23/87

COMPARISONS OF FACTORS EXTRACTED FROM THE CORRELATION VERSUS THE COVARIANCE MATRIX: AN EXAMPLE USING THE LOVE RELATIONSHIPS SCALE

Bruce Thompson Gloria M. Borrello

University of New Orleans 70148

Paper presented at the annual meeting of the Southwest Educational Research Association, Dallas, January 29, 1987.

ABSTRACT

Attitude measures frequently produce distributions of item scores that attenuate interitem correlations and thus also distort findings regarding the factor structure underlying the items. An actual data set involving 260 adult subjects' responses to 55 items on the Love Relationships Scale is employed to illustrate empirical methods for identifying such items during test construction or test validation. Two methods for identifying these items are proposed, and it is noted that examination of item descriptive statistics may not successfully substitute for an empirical method for identifying potentially troublesome items.

The first factor analytic method was the principal components model originally conceptualized by Pearson (1901) and later developed by Hotelling (1933). The merits of few techniques have been debated as heatedly as have the merits of factor analysis (Royce, 1980; Tryon, 1979). Cronkhite and Liska (1980, p. 102) are particularly ascerbic in their comment that it is apparently

> so easy to capture college students to use the scales to rate the sources, so easy to submit those ratings to factor analysis, so much fun to name the factors when one's research assistant returns with the computer printout, and so rewarding to have a guaranteed publication with no fear of nonsignificant results that researchers, once exposed to the pleasures of the factor analytic approach, rapidly become addicted to it.

Similarly, Sax (1979, p. 80) notes that

> the relative simplicity of this discriminative [i.e., correlational] approach has appealed to many graduate students [and faculty] who, once they have mastered the technique of computing correlations or other statistics, have used these methods without due regard for the value of their research proposals.

Notwithstanding these criticisms, it is clear that some factor analytic applications have proven very useful to behavioral scientists. First, factor analysis can be usefully applied as a prelude to analysis of variance techniques in

experimental studies (Morrow & Frankiewicz, 1979). McCulloch and Thompson (1982) report such a study in which factor analysis was employed to conserve degrees of freedom as a function of the data reduction features of the method. These applications may be especially useful if factor scores are computed in their non-Zscore form (Thompson, 1983). Second, factor analysis can be employed in substantive investigations to minimize distortions introduced by measurement error (Thompson, 1982, pp. 2-4). Third, the methods can provide potent assistance in theory building, as Guilford (1959) and others (cf. Thompson, 1980) have demonstrated.

But factor analysis has been shown to be particularly useful in instrument construction or in investigating instrument validity. Thus Nunnally (1967, p. 100) notes that some researchers have referred to construct validity as "factorial validity." Various examples of this application are available (cf. Thompson & Borrello, 1986). Thompson and Pitts (1981/82) have proposed confirmatory factor rotation as one empirical method for evaluating how adequately actual and expected results correspond. Confirmatory factor extraction methods (Joreskog, 1969) can also be employed to evaluate instrument validity (cf. Thompson, Webber & Berenson, 1987).

The purpose of the present paper is to present two methods for identifying items that may distort the factor structure underlying item responses. It will be argued that these methods may be particularly helpful in the test construction of attitude measures. In order to make the discussion concrete, an actual

data set (Borrello & Thompson, 1986) will be employed to provide heuristic examples. The data were provided by 260 adult subjects who reacted to the 55 attitude statements on the Love Relationships Scale, a measure of attitudes about love and about love relationships.

Theoretical Background for the Methods

The principal component model is among the simplest of the factor analytic models. The method assumes no measurement error and that all the variance of each factored entity is relevant to the analysis. Unlike various other models, the principal components method does not require iterative estimation of the communalities of each variable, due to the assumption of no measurement error. In addition to its simplicity, the model has the advantage that factor scores based on model results can be directly calculated rather than estimated (Gorsuch, 1983, p. 122). Furthermore, if the factors are uncorrelated due to orthogonal rotation, the factor scores produced using the model are also perfectly uncorrelated; this will not be the case when certain other models are employed.

Most exploratory factor extraction procedures, e.g., models using principal factors, image, alpha, or canonical extraction methods, are variants of the principal components method. Even in the presence of measurement error, Monte Carlo studies (Gorsuch, 1983, p. 123) indicate that when the number of factored entities (usually variables) is large, the methods produce very similar results. As Thompson (1986, p. 3) explains,

> This is because the number of entries on the

diagonal of the correlation [or other association index] matrix becomes rapidly smaller relative to the total number of matrix values as the number of factored entities ($\underline{v}$) increases (2/4 if $\underline{v}$=2; 3/9 if $\underline{v}$=3; 4/16 if $\underline{v}$=4; etc.).

Although principal components methods are typically employed to extract factors from the correlation matrix, factors can also be extracted from other matrices as well. For example, factors can be extracted from a matrix consisting of covariances off the matrix diagonal and the variance of each variable on the matrix diagonal. The factors extracted from a variance-covariance matrix, however, are not "scale free." That is, the factors in such a case are influenced both by the patterns of associations among the variables (i.e., covariance coefficients) and by the variabilities of the variables (i.e., the variances). In general this is not desirable in social science research, since typically the metrics of ability or attitude measures have little intrinsic meaning. For example, a set of test scores may have a standard deviation of 5.0. If the scores are multiplied by 2.0, the standard deviation of the "new" scores will be 10.0, but no meaning will have been lost or changed. The metrics of most scales in the non-physical world are arbitrary and have been left to chance or have been selected by the researcher for convenience.

The apparent implication is that usually one would prefer factors extracted from a correlation matrix, since these factors are not influenced by arbitrary scale characteristics. However, in reality correlation coefficients are indeed affected by

differences in distribution shapes, including differences in variability. This is taught even in elementary statistics texts. Thus, formulas exist to correct correlation coefficients for attentuation due to restricted variabilities of variables (Guilford, 1965, p. 480).

Logically, if factors extracted from a correlation matrix associated with a given data set differed from the factors extracted from the variance-covariance matrix for the same data set, one might learn which variables' variabilities have proven problematic as regards establishing an accurate representation of the structure underlying item responses. This comparison might be particulatly helpful when the variables are attitude measures, because attitude variables typically involve skewed distributions with somewhat restricted ranges (Kerlinger, 1973, p. 496).

Two empirical methods for comparing the factors derived from the two matrices are proposed and illustrated employing the heuristic data set. Table 1 presents descriptive statistics for the 260 subjects' responses on the 55 Love Relationships Scale items. Table 2 presents the structure coefficients for factors extracted from the correlation matrix, and rotated to the varimax criterion. Table 3 presents the rotated results for factors extracted from the variance-covariance matrix.

INSERT TABLES 1, 2 AND 3 ABOUT HERE.

Method I: "Best Fit" Factor Rotation

In an appendix to a book by other authors, Kaiser, Hunka, and Bianchini (1969) suggested that factors involving the same

variables could be rotated to positions of "best fit" with each other, and the cosines of the angles among the factors could then be computed. These cosines are correlation coefficients. Veldman (1967) presents a computer program that performs the necessary analysis. Gorsuch (1983, pp. 283-288) discusses the method. Thompson (1986) presents several applications and a partial test distribution for these coefficients.

With respect to the heuristic data from the love attitude study, four of the eight factors extracted from the correlation matrix had correlation coefficients with factors from the variance-covariance matrix greater than 0.95. Two factors from the two sources had correlation coefficients across the two sources that were greater than 0.80 and less than 0.95. The second factor from both the two sources had a correlation coefficient of 0.74. The third factor extracted from the correlation matrix was appreciably correlated with several factors extracted from the variance-covariance matrix, including Factor II (0.65), Factor VI (0.43), Factor VIII (0.38), and Factor V (.35).

Gorsuch (1983) has noted that cosines of the angles among factored entities must be consulted in addition to examining the cosines among the factors themselves. As Gorsuch (1983, p. 284) explains, "if the mean cosine [among the variables] is low, it is not possible to relate factors at all because the relationships among the variables are different." In the present example the mean item cosine for the 55 variables was quite high, i.e., 0.94.

However, the item cosines can still be examined to identify selected items that attentuate the comparability of the factors extracted from the two different matrices of association. Six of the 55 items had cosines less than 0.85: item 21 (0.59), item 38 (0.70), item 8 (0.74), item 37 (0.77), item 3 (0.77), and item 44 (0.79).

Method II: Comparison of the Reproduced Correlation Matrices

Each successive factor extracted from the correlation matrix using a principal components model accounts for a maximum of the variance in the total correlation matrix (**R**). When all possible factors are extracted using this model, i.e., when the number of factors equals the number of factored entities, the factors will exactly reproduce the correlation matrix. The formula (Gorsuch, 1983, p. 77) for using factors to reproduce the "explained" portion ($\bar{\mathbf{R}}$) of the correlation matrix (R) is:

$$\bar{\mathbf{R}}_{VxV} = \mathbf{P}_{VxF} \; \mathbf{P}'_{FxV} ,$$

where $\underline{V}$ equals the number of factored entities,

$\underline{P}$ equals the orthogonal factor structure matrix,

$\underline{F}$ equals the number of principal components.

Thus, in the present example, the 55-by-55 correlation matrix would be exactly reporoduced by matrix manipulation of a 55-variable-by-55-factor solution.

However, more typical usage of factor analysis involves an effort to "condense" the noteworthy variance in the correlation (or the variance-covariance) matrix into a smaller set of factored variables. For example, the researcher might wish to condense raw scores of 260 subjects on 55 variables into factor

scores of 260 subjects on each of eight factors. The portion ($\bar{R}$) of the original correlation matrix (R) that can be reproduced from the eight factors could then be estimated by:

$$\bar{R}_{55x55} = P_{55x8} \; P'_{8x55} \; .$$

This matrix is presented for the heuristic data in Appendix A.

The portion (R*) of the original correlation matrix (R) that is <u>not</u> reproducable from the factors can be calculated (Gorsuch, 1983, p. 77) by the formula:

$$R^*_{55x55} = R_{55x55} - \bar{R}_{55x55} \; .$$

This suggests that the two correlation matrices that would be "reproduced" by the factor structure extracted from the correlation matrix and by the structure extracted from the variance-covariance matrix might both be computed and then compared to evaluate the effects of variable variability on identified structure. Appendix B presents the "reproduced" correlation matrix that was generated for the structure from the variance-covariance matrix that was presented in Table 2. Appendix C presents the difference matrix derived by subtracting the "reproduced" correlation matrix from the variance-covariance factors (Appendix B) from the "reproduced" correlation matrix derived using the factors actually extracted from the correlation matrix (Appendix A).

The difference matrix produced in this manner is analogous to the "residual" correlation matrix produced by many factor analysis statistical packages. This is not actually a correlation

matrix. As Gorsuch (1983, p. 143) notes, "An error often made is to interpret the elements of the residual matrix as correlations. Despite the fact that the off-diagonal elements look like correlations, they are actually covariances."

The non-diagonal entries in this difference matrix would all equal zero if the two structure matrices reproduced the same correlation matrix. Variables with several large off-diagonal entries are the sources of discrepancies between the two structures--these variables cause the two solutions to diverge due to their variabilities. When the absolute values of the off-diagonal entries in this matrix (Appendix C) are summed, the six variables with the largest sums are, respectively: variable 38 (3.53); variable 3 (3.38); variable 44 (2.86); variable 21 (2.76); variable 36 (2.72); and variable 2 (2.69). When the values of the off-diagonal entries in this matrix (Appendix C) are squared and summed, the six variables with the largest sums are, respectively: variable 38 (0.38); variable 3 (0.35); variable 44 (0.24); variable 21 (0.24); variable 36 (0.23); and variable 2 (0.22).

Discussion

Two methods for identifying items that may distort the structure of factors extracted from correlation matrices due to the items' distributions have been presented. The first method involves the use of "best fit" rotation. The second method involves the comparison of the "reproduced" correlation matrices computed from two structure matrices.

It is noteworthy that both methods identified several of the

same items as being potentially troublesome (e.g., items 3, 21, 38, and 44). This suggests that the two methods yield somewhat comparable results. Since the "best fit" rotation method is more widely available to researchers who use Veldman's (1967) computer program, this method will often be the method of choice for the researcher who wishes to identify potentially troublesome items. However, it may be wise to employ both methods as a cross-validation of conclusions regarding potentially troublesome items.

It must be emphasized that merely examining descriptive statistics such as those presented in Table 1 will not be sufficient for identifying items whose distributions are affecting factor structure. Some of the items identified in the two analyses as being potentially troublesome had distributions that were similar to those of items that did not create difficulties. Inspection of descriptive statistics will not serve as an acceptable substitute for empirical determination of which distributions do or do not affect structure.

In summary, attitude measures frequently produce distributions of item scores that may attenuate interitem correlations and thus may also distort findings regarding the factor structure underlying the items. An actual data set involving 260 adult subjects' responses to 55 items on the Love Relationships Scale was employed to illustrate empirical methods for identifying such items during test construction or test validation. Two methods for identifying these items were proposed, and it was noted that examination of item descriptive statistics may not successfully substitute for an empirical

method for identifying potentially troublesome items.

References

Borrello, G. M., & Thompson, B. (November, 1986). Concurrent and construct validity of a love relationships scale. Paper presented at the annual meeting of the Mid-South Educational Research Association, Memphis, TN.

Cronkhite, G., & Liska, J. R. (1980). The judgment of communicant acceptability. In M. E. Roloff & G. R. Miller (Eds.), Persuasion: New directions in theory and research. Beverly Hills: SAGE, pp. 101-139.

Gorsuch, R. (1983). Factor analysis (2nd ed.). Hillsdale, NJ: Erlbaum.

Guilford, J. P. (1959). Three faces of intellect. American Psychologist, 14, 469-479.

Guilford, J. P. (1965). Fundamental statistics in psychology and education (4th ed.). New York: McGraw-Hill.

Hotelling, H. (1933). Analysis of a complex of statistical variables into principal components. Journal of Experimental Psychology, 24, 417-441, 498-520.

Joreskog, K. G. (1969). A general approach to confirmatory maximum likelihood factor analysis. Psychometrika, 34, 183-202.

Kaiser, H. F., Hunka, S., & Bianchini, J. (1969). Relating factors between studies based upon different individuals. In H. J. Eysenck & S. B. G. Eysenck (Eds.), Personality structure and measurement. San Diego: Knapp, pp. 333-343.

Kerlinger, F. N. (1973). Foundations of behavioral research (2nd ed.). New York: Holt, Rinehart and Winston.

McCulloch, J. M., & Thompson, B. (1982). Cross-discipline

generalizability of Fuller's professional concerns model. _Physical Therapy Education_, _25_, 8-9.

Morrow, J. R., Jr., & Frankiewicz, R. G. (1979). Strategies for the analysis of repeated and multiple measures designs. _Research Quarterly_, _50_, 297-304.

Nunnally, J. C. (1967). _Psychometric theory_. New York: McGraw-Hill.

Pearson, K. (1901). On lines and planes of closest fit to systems of points in space. _Philosophical Magazine_, _6_(2), 559-572.

Royce, J. R. (1980). Factor analysis is alive and well. _American Psychologist_, _35_, 390-392.

Sax, G. (1979). _Foundations of educational research_ (2nd ed.). Englewood Cliffs: Prentice-Hall.

Thompson, B. (1980). Validity of an evaluator typology. _Educational Evaluation and Policy Analysis_, _2_, 59-65.

Thompson, B. (January, 1982). _Factor analysis based on "doubly-centered" raw data matrices_. Paper presented at the annual meeting of the Southwest Educational Research Association, Austin. (ERIC Document Reproduction Service No. ED 219 404)

Thompson, B. (January, 1983). _The calculation of factor scores: An alternative_. Paper presented at the annual meeting of the Southwest Educational Research Association, Houston.

Thompson, B. (April, 1986). _A partial test distribution for cosines among factors across samples_. Paper presented at the annual meeting of the American Educational Research Association, San Francisco.

Thompson, B., & Borrello, G. M. (1986). Second-order factor

structure of the MBTI: A construct validity assessment. Measurement and Evaluation in Counseling and Development, 18, 148-153.

Thompson, B., & Pitts, M. C. (1981/82). The use of factor adequacy coefficients. Journal of Experimental Education, 50, 101-104.

Thompson, B., Webber, L., & Berenson, G. S. (January, 1987). Confirmatory structure analysis of a children's health locus of control measure: A "Heart Smart" Study. Paper presented at the annual meeting of the Southwest Educational Research Association, Dallas.

Tryon, W. W. (1979). The test-trait fallacy. American Psychologist, 34, 402-406.

Veldman, D. J. (1967). FORTRAN programming for the behavioral sciences. New York: Holt, Rinehart & Winston.

Table 1
Descriptive Statistics

Variable	Mean	SD	Kurtosis	Skewness
1 SEXLOVE	7.738	2.623	-.169	-.934
2 COMMIT	2.873	2.226	1.461	1.336
3 ALWAYTHR	2.723	2.358	2.451	1.747
4 HURTHINK	7.538	2.488	-.710	-.643
5 ALREMIND	4.104	2.644	-.265	.790
6 MEMORIES	2.142	1.813	5.712	2.241
7 HARDWORK	2.469	2.314	3.231	1.970
8 ACTOWILL	5.618	3.129	-1.271	.015
9 PERMFEEL	5.885	3.213	-1.377	-.083
10 LUVPHYSI	8.467	2.204	1.763	-1.548
11 NOTSENSE	5.523	3.023	-1.161	.042
12 EFFORT	3.508	2.746	-.263	.942
13 NOEXPECT	4.712	2.753	-1.001	.312
14 FAITHFUL	1.962	1.919	6.264	2.566
15 AFFECTON	2.065	1.766	7.313	2.536
16 FIRSTSEE	5.846	2.828	-1.026	-.008
17 CONSUMIN	7.023	2.633	-.807	-.482
18 UNCONTRL	5.512	3.168	-1.371	.036
19 WORLDCTR	6.842	2.797	-.949	-.480
20 ALLGOOD	6.685	2.846	-1.069	-.401
21 LOOKS	8.469	2.155	1.912	-1.587
22 TIMEFAST	4.762	2.972	-.987	.401
23 TOTALIVE	3.185	2.385	1.178	1.333
24 NOLAST	6.777	3.154	-1.059	-.591
25 SUMCONSU	3.496	2.329	.365	.888
26 ALIVE	4.481	2.957	-.767	.625
27 AFRAID	7.277	2.664	-.648	-.670
28 CBEAUTY	3.408	2.383	.604	1.066
29 DESPERAT	3.896	2.663	-.273	.790
30 CONSTANT	4.756	2.830	-.880	.463
31 ALUNIQUE	1.965	1.804	8.441	2.781
32 INATTENT	7.358	2.613	-.257	-.820
33 SEEMEANG	3.765	2.317	.670	.904
34 LESSSIGN	5.346	2.826	-1.095	.277
35 LUVBLIND	4.745	2.864	-.902	.500
36 SEXESSEN	5.677	3.099	-1.331	.075
37 PICKPHYS	3.396	2.303	.850	1.135
38 FORGIVE	2.673	1.838	2.349	1.433
39 ONLYFEW	3.162	2.390	1.081	1.324
40 NOTREALI	5.231	2.607	-.766	.194
41 SAYANYTH	3.581	2.810	.054	1.076
42 THOUGHT	5.761	2.903	-1.206	.027
43 LLREMIND	6.327	2.860	-1.133	-.236
44 FIRSTSIG	6.650	3.664	-1.485	-.477
45 EMOTIONL	2.798	1.857	1.723	1.249
46 DAYDREAM	6.973	2.715	-.843	-.484
47 HAPPYSAD	5.510	2.874	-1.015	.101
48 REJECTIO	6.308	2.728	-.964	-.235
49 SELFSTUF	3.742	2.311	.317	.884
50 NOCONTRL	5.685	2.783	-1.031	.052

51	UNCRTAIN	5.927	2.806	-1.072	-.066
52	TOTALLUV	5.177	3.071	-1.202	.239
53	CONCENTR	7.058	2.701	-.836	-.541
54	WORRYATT	5.754	3.002	-1.259	.003
55	FEARREJC	5.421	2.826	-1.042	.076

Table 2
Factor Structure from Correlation Matrix

1	SEXLOVE	0.160	0.010	0.010	0.069	-0.086	0.530	-0.052	0.169
2	COMMIT	0.176	-0.069	0.553	0.105	-0.056	-0.063	-0.209	0.105
3	ALWAYTHR	0.117	-0.103	0.613	0.166	0.000	-0.002	-0.114	0.003
4	HURTHINK	0.455	-0.068	0.156	0.297	0.005	0.187	0.059	0.165
5	ALREMIND	0.608	0.138	0.329	0.203	0.007	-0.134	0.103	-0.074
6	MEMORIES	-0.023	0.304	0.576	0.034	0.018	-0.110	0.066	-0.193
7	HARDWORK	0.029	0.070	0.455	-0.067	0.086	-0.289	0.243	0.254
8	ACTOWILL	0.013	0.015	-0.030	0.027	-0.104	0.062	-0.033	0.044
9	PERMFEEL	0.218	0.140	0.077	0.143	0.155	0.077	-0.455	0.086
10	LUVPHYSI	0.005	-0.138	-0.178	0.112	0.087	0.615	0.105	-0.013
11	NOTSENSE	0.075	-0.107	0.116	0.105	0.661	-0.161	0.239	-0.105
12	EFFORT	0.013	-0.003	0.111	0.004	0.066	-0.001	-0.094	0.634
13	NOEXPECT	0.316	-0.014	0.161	0.151	0.221	-0.226	-0.065	0.510
14	FAITHFUL	0.105	0.178	0.641	-0.050	-0.128	0.041	-0.150	0.012
15	AFFECTON	-0.007	0.318	0.605	-0.154	0.159	0.084	0.050	0.125
16	FIRSTSEE	0.274	-0.050	-0.034	0.263	0.130	0.078	0.369	-0.151
17	CONSUMIN	0.430	-0.112	0.022	0.265	0.281	0.171	0.148	0.201
18	UNCONTRL	0.254	0.101	-0.082	-0.039	0.634	-0.099	-0.063	-0.026
19	WORLDCTR	0.533	0.055	0.066	0.126	0.159	0.279	-0.271	-0.013
20	ALLGOOD	0.594	-0.006	-0.060	0.124	0.068	0.117	-0.060	0.139
21	LOOKS	0.169	-0.196	-0.004	0.226	0.066	0.519	0.127	-0.043
22	TIMEFAST	0.457	0.175	0.214	-0.040	0.092	0.200	0.171	-0.019
23	TOTALIVE	0.412	0.512	0.221	-0.065	0.033	0.112	-0.057	-0.182
24	NOLAST	-0.161	-0.032	-0.042	-0.026	0.009	0.109	0.556	0.049
25	SUMCONSU	0.036	0.366	0.139	0.009	-0.010	-0.118	0.462	-0.086
26	ALIVE	0.492	0.238	0.252	-0.048	0.082	0.131	-0.006	-0.068
27	AFRAID	0.445	0.096	-0.111	0.248	0.174	0.057	0.276	0.265
28	CBEAUTY	0.359	0.396	0.051	0.115	0.101	0.036	-0.089	0.107
29	DESPERAT	0.353	0.283	0.190	-0.013	0.252	0.201	-0.097	0.087
30	CONSTANT	0.780	0.069	0.015	0.047	0.185	0.087	-0.073	0.019
31	ALUNIQUE	0.016	0.587	0.151	0.132	-0.107	-0.141	-0.238	-0.048
32	INATTENT	0.170	-0.092	-0.011	0.620	0.049	0.177	0.009	0.092
33	SEEMEANG	0.320	0.268	0.304	0.105	0.127	-0.173	0.255	0.053
34	LESSSIGN	0.463	0.288	-0.035	0.225	0.181	-0.021	-0.087	-0.229
35	LUVBLIND	0.340	0.167	-0.020	0.056	0.445	0.157	-0.100	0.144
36	SEXESSEN	0.175	0.079	0.151	0.030	0.065	0.512	-0.052	-0.135
37	PICKPHYS	-0.054	0.142	0.450	0.072	0.214	0.133	0.094	0.084
38	FORGIVE	-0.008	0.699	-0.004	-0.071	-0.023	-0.155	0.102	0.036
39	ONLYFEW	-0.201	0.481	0.266	0.094	0.297	0.099	-0.030	-0.075
40	NOTREALI	0.215	0.019	0.134	0.102	0.585	0.209	-0.069	0.072
41	SAYANYTH	0.436	0.066	0.067	0.072	0.027	-0.223	-0.359	0.072
42	THOUGHT	0.794	-0.060	0.056	0.037	0.194	-0.060	-0.110	-0.054
43	LLREMIND	0.742	0.042	0.057	0.241	0.048	0.092	-0.125	-0.010
44	FIRSTSIG	0.439	-0.030	-0.138	0.213	-0.018	0.021	0.390	-0.210
45	EMOTIONL	-0.006	0.575	0.141	0.073	0.227	-0.117	-0.056	-0.044
46	DAYDREAM	0.443	0.087	0.026	0.348	-0.057	0.232	-0.233	0.187
47	HAPPYSAD	0.380	0.002	0.210	0.358	0.164	-0.065	0.125	0.236
48	REJECTIO	0.231	0.115	0.055	0.756	0.010	0.091	-0.058	0.018
49	SELFSTUF	0.280	0.540	0.073	0.104	-0.074	0.133	0.067	0.183
50	NOCONTRL	0.263	0.197	0.015	0.273	0.531	0.135	-0.141	0.030

51 UNCRTAIN	0.116	0.115	0.159	0.732	0.126	0.012	-0.125	-0.107
52 TOTALLUV	0.358	0.105	0.223	0.247	0.183	0.022	-0.344	0.135
53 CONCENTR	0.644	-0.042	-0.101	0.192	0.186	0.236	-0.069	0.154
54 WORRYATT	0.277	0.242	-0.107	0.316	0.235	0.241	0.165	0.070
55 FEARREJC	0.191	0.358	-0.119	0.436	0.216	0.185	0.154	0.144

Table 3
Factor Structure from Variance-Covariance Matrix

1	SEXLOVE	0.158	-0.039	0.090	-0.068	0.014	0.162	0.540	0.073
2	COMMIT	0.140	0.280	0.063	-0.036	0.306	0.181	-0.056	-0.054
3	ALWAYTHR	0.105	0.301	0.117	-0.052	0.257	0.173	-0.142	0.052
4	HURTHINK	0.456	0.027	0.278	-0.015	0.032	0.196	0.073	0.131
5	ALREMIND	0.582	0.362	0.153	-0.024	0.063	-0.013	-0.228	0.186
6	MEMORIES	-0.020	0.580	0.005	-0.016	0.085	-0.066	-0.097	0.046
7	HARDWORK	-0.022	0.427	-0.100	0.076	-0.046	0.318	-0.208	0.110
8	ACTOWILL	0.009	-0.033	-0.001	-0.116	-0.002	0.753	0.182	0.024
9	PERMFEEL	0.107	0.117	0.128	0.186	0.572	0.136	0.311	-0.028
10	LUVPHYSI	0.062	-0.265	0.161	0.077	-0.188	0.017	0.468	0.073
11	NOTSENSE	0.031	0.091	0.086	0.682	-0.126	-0.016	-0.176	0.148
12	EFFORT	0.043	0.036	0.019	0.065	0.053	0.585	0.029	-0.098
13	NOEXPECT	0.302	0.097	0.138	0.272	0.135	0.467	-0.215	-0.103
14	FAITHFUL	0.124	0.492	-0.013	-0.151	0.197	0.091	-0.026	-0.115
15	AFFECTON	0.024	0.599	-0.092	0.076	0.038	0.201	0.064	-0.009
16	FIRSTSEE	0.163	-0.041	0.206	0.163	-0.116	-0.066	0.067	0.541
17	CONSUMIN	0.515	-0.114	0.297	0.261	-0.094	0.174	0.018	0.066
18	UNCONTRL	0.202	0.044	-0.094	0.752	0.098	-0.025	0.003	0.055
19	WORLDCTR	0.547	-0.011	0.141	0.169	0.272	-0.013	0.246	-0.012
20	ALLGOOD	0.528	-0.068	0.094	0.132	0.151	0.149	0.199	0.175
21	LOOKS	0.314	-0.214	0.310	-0.019	-0.217	-0.071	0.163	-0.083
22	TIMEFAST	0.569	0.277	0.032	0.030	-0.207	-0.070	0.024	-0.058
23	TOTALIVE	0.406	0.539	-0.020	0.018	0.067	-0.180	0.188	0.015
24	NOLAST	-0.117	0.022	0.014	0.003	-0.632	0.125	0.024	0.139
25	SUMCONSU	-0.023	0.428	-0.027	0.029	-0.251	-0.052	-0.012	0.273
26	ALIVE	0.537	0.363	-0.038	0.046	0.038	-0.060	0.073	-0.008
27	AFRAID	0.471	-0.020	0.274	0.200	-0.201	0.168	-0.032	0.114
28	CBEAUTY	0.387	0.292	0.146	0.094	0.061	0.008	0.050	-0.034
29	DESPERAT	0.409	0.297	0.082	0.176	0.073	0.047	0.138	-0.059
30	CONSTANT	0.787	0.023	0.058	0.146	0.118	-0.002	0.059	0.086
31	ALUNIQUE	0.010	0.467	0.084	-0.060	0.243	-0.081	-0.002	-0.048
32	INATTENT	0.220	-0.126	0.615	0.020	-0.004	0.074	0.053	0.019
33	SEEMEANG	0.297	0.445	0.102	0.108	-0.066	0.054	-0.151	0.081
34	LESSSIGN	0.372	0.205	0.196	0.218	0.201	-0.238	0.084	0.207
35	LUVBLIND	0.377	0.091	0.098	0.429	0.031	0.097	0.168	-0.051
36	SEXESSEN	0.157	0.161	0.058	0.078	0.059	-0.092	0.699	0.025
37	PICKPHYS	0.036	0.407	0.121	0.114	-0.088	0.112	-0.003	-0.090
38	FORGIVE	-0.026	0.490	-0.073	0.030	-0.047	-0.029	0.013	0.049
39	ONLYFEW	-0.079	0.506	0.115	0.206	-0.045	-0.131	0.077	-0.267
40	NOTREALI	0.263	0.077	0.168	0.474	0.052	0.089	0.157	-0.015
41	SAYANYTH	0.376	0.055	-0.004	0.016	0.456	0.100	-0.175	0.050
42	THOUGHT	0.715	-0.030	-0.021	0.215	0.287	0.000	-0.025	0.224
43	LLREMIND	0.726	0.000	0.229	0.040	0.240	-0.013	0.043	0.125
44	FIRSTSIG	0.236	-0.028	0.071	0.007	-0.072	-0.073	0.114	0.880
45	EMOTIONL	0.001	0.498	0.059	0.173	0.101	-0.028	-0.006	0.012
46	DAYDREAM	0.492	-0.021	0.393	-0.078	0.183	0.133	0.120	-0.056
47	HAPPYSAD	0.341	0.178	0.310	0.116	0.040	0.322	-0.142	0.288
48	REJECTIO	0.191	0.080	0.734	0.026	0.175	0.026	0.067	0.145
49	SELFSTUF	0.301	0.407	0.150	-0.052	-0.017	0.054	0.150	0.001
50	NOCONTRL	0.273	0.133	0.318	0.494	0.150	0.003	0.113	0.023

51	UNCRTAIN	0.068	0.187	0.697	0.107	0.225	-0.033	0.014	0.153
52	TOTALLUV	0.373	0.168	0.267	0.117	0.387	0.151	-0.020	-0.053
53	CONCENTR	0.653	-0.149	0.237	0.161	0.091	0.104	0.150	0.093
54	WORRYATT	0.398	0.077	0.448	0.174	-0.274	-0.096	0.107	-0.060
55	FEARREJC	0.222	0.183	0.517	0.246	-0.143	-0.012	0.188	0.011

Appendix A
Correlation Matrix Reproduced from Table 1 Structure

1	0.35										
2	0.04	0.41									
3	0.04	0.41	0.44								
4	0.22	0.20	0.20	0.39							
5	0.03	0.28	0.28	0.35	0.57						
6	-0.09	0.27	0.32	0.02	0.26	0.48					
7	-0.13	0.23	0.24	0.06	0.21	0.28	0.43				
8	0.16	0.06	-0.01	0.12	-0.05	-0.15	0.11	0.43			
9	0.11	0.18	0.13	0.15	0.14	0.03	-0.06	0.07	0.34		
10	0.32	-0.14	-0.09	0.14	-0.12	-0.20	-0.25	0.02	0.00	0.46	
11	-0.15	0.01	0.08	0.06	0.15	0.10	0.18	-0.15	0.00	-0.01	0.57
12	0.11	0.15	0.08	0.12	-0.01	-0.06	0.19	0.40	0.12	-0.03	-0.03
	0.43										
13	0.01	0.23	0.17	0.25	0.26	0.01	0.27	0.30	0.19	-0.14	0.17
	0.37	0.51									
14	0.06	0.39	0.40	0.12	0.27	0.40	0.25	0.01	0.14	-0.15	-0.07
	0.09	0.10	0.50								
15	0.05	0.28	0.31	0.06	0.19	0.41	0.34	0.05	0.09	-0.10	0.11
	0.15	0.14	0.43	0.54							
16	0.05	-0.04	0.02	0.21	0.24	0.02	0.01	-0.11	-0.07	0.14	0.23
	-0.12	0.03	-0.09	-0.05	0.33						
17	0.19	0.10	0.11	0.38	0.32	-0.07	0.06	0.12	0.14	0.19	0.25
	0.14	0.31	-0.02	0.03	0.28	0.48					
18	-0.07	-0.03	-0.03	0.06	0.15	0.00	0.04	-0.08	0.17	-0.01	0.42
	0.03	0.21	-0.08	0.07	0.11	0.24	0.50				
19	0.24	0.17	0.15	0.32	0.32	0.00	-0.10	0.01	0.32	0.15	0.05
	0.04	0.18	0.13	0.07	0.12	0.33	0.22	0.48			
20	0.19	0.10	0.06	0.34	0.33	-0.09	-0.03	0.10	0.20	0.10	0.05
	0.10	0.26	0.02	-0.03	0.17	0.38	0.18	0.39	0.41		
21	0.30	0.00	0.06	0.25	0.07	-0.10	-0.15	0.00	0.03	0.39	0.05
	-0.03	-0.04	-0.04	-0.05	0.22	0.28	0.00	0.23	0.18	0.41	
22	0.16	0.13	0.14	0.26	0.36	0.16	0.11	-0.01	0.09	0.08	0.11
	0.01	0.12	0.19	0.23	0.19	0.28	0.15	0.29	0.27	0.17	0.37
23	0.10	0.14	0.13	0.16	0.37	0.29	0.06	-0.11	0.19	-0.05	0.00
	-0.08	0.04	0.29	0.29	0.08	0.11	0.16	0.31	0.21	0.01	0.35
	0.53										
24	0.01	-0.17	-0.11	-0.02	-0.08	-0.02	0.09	0.02	-0.29	0.13	0.10
	-0.03	-0.10	-0.13	0.01	0.16	0.03	-0.08	-0.21	-0.11	0.10	0.03
	-0.12	0.35									
25	-0.09	-0.04	0.00	0.01	0.19	0.25	0.21	-0.07	-0.16	-0.10	0.11
	-0.08	-0.02	0.08	0.20	0.16	0.01	0.01	-0.11	-0.04	-0.06	0.17
	0.21	0.22	0.39								
26	0.13	0.19	0.18	0.25	0.39	0.20	0.10	-0.04	0.17	0.01	0.07
	0.00	0.14	0.25	0.25	0.13	0.23	0.17	0.34	0.28	0.10	0.36
	0.41	-0.09	0.13	0.39							
27	0.13	-0.01	-0.02	0.32	0.30	-0.07	0.08	0.16	0.07	0.11	0.18
	0.15	0.30	-0.08	0.00	0.27	0.42	0.20	0.23	0.34	0.18	0.26
	0.14	0.10	0.13	0.20	0.46						

28	0.10	0.10	0.06	0.20	0.29	0.12	0.06	0.08	0.22	-0.03	0.03
	0.09	0.21	0.14	0.16	0.07	0.20	0.19	0.28	0.25	0.02	0.24
	0.35	-0.11	0.11	0.28	0.24	0.33					
29	0.16	0.15	0.14	0.21	0.27	0.15	0.08	0.05	0.24	0.06	0.12
	0.11	0.20	0.20	0.27	0.07	0.25	0.25	0.34	0.25	0.11	0.30
	0.35	-0.10	0.06	0.33	0.21	0.30	0.36				
30	0.17	0.15	0.11	0.38	0.48	0.00	0.01	0.01	0.26	0.06	0.15
	0.04	0.29	0.09	0.05	0.22	0.44	0.32	0.50	0.50	0.18	0.39
	0.37	-0.16	0.01	0.43	0.39	0.34	0.37	0.66			
31	-0.04	0.12	0.08	-0.02	0.16	0.28	0.06	-0.01	0.19	-0.21	-0.13
	0.00	0.04	0.24	0.21	-0.10	-0.12	0.01	0.08	0.00	-0.19	0.06
	0.33	-0.18	0.15	0.16	-0.03	0.26	0.16	0.05	0.48		
32	0.17	0.09	0.12	0.32	0.18	-0.05	-0.07	0.08	0.14	0.20	0.08
	0.06	0.16	-0.04	-0.10	0.22	0.32	0.02	0.22	0.22	0.28	0.07
	-0.02	-0.01	-0.05	0.05	0.27	0.12	0.08	0.18	-0.01	0.46	
33	-0.04	0.17	0.19	0.20	0.40	0.28	0.30	0.00	0.04	-0.15	0.21
	0.06	0.24	0.21	0.28	0.18	0.21	0.16	0.12	0.16	-0.03	0.27
	0.29	0.05	0.28	0.28	0.26	0.24	0.22	0.27	0.17	0.07	0.39
34	0.03	0.05	0.05	0.21	0.37	0.11	-0.06	-0.15	0.22	-0.01	0.15
	-0.12	0.10	0.05	0.03	0.20	0.24	0.27	0.34	0.29	0.07	0.25
	0.37	-0.15	0.10	0.30	0.24	0.31	0.27	0.42	0.22	0.18	0.23
	0.44										
35	0.13	0.04	0.03	0.21	0.20	-0.01	0.01	0.07	0.24	0.11	0.24
	0.13	0.25	0.02	0.13	0.11	0.32	0.37	0.34	0.28	0.13	0.23
	0.23	-0.09	-0.01	0.25	0.28	0.27	0.33	0.39	0.05	0.14	0.17
	0.27	0.40									
36	0.28	0.07	0.11	0.18	0.11	0.08	-0.11	-0.06	0.13	0.28	-0.01
	-0.06	-0.08	0.15	0.14	0.10	0.16	0.04	0.28	0.15	0.29	0.23
	0.23	-0.02	-0.02	0.22	0.07	0.12	0.23	0.20	0.02	0.12	0.03
	0.14	0.17	0.35								
37	0.06	0.21	0.26	0.10	0.14	0.29	0.23	0.03	0.06	0.02	0.17
	0.11	0.12	0.27	0.37	0.04	0.10	0.08	0.06	-0.01	0.07	0.15
	0.15	0.06	0.13	0.15	0.05	0.09	0.18	0.02	0.09	0.06	0.20
	0.02	0.12	0.14	0.31							
38	-0.08	-0.07	-0.10	-0.09	0.10	0.22	0.13	0.02	0.03	-0.19	-0.05
	0.01	0.02	0.11	0.22	-0.04	-0.11	0.07	-0.05	-0.04	-0.22	0.10
	0.33	0.02	0.32	0.14	0.07	0.25	0.15	0.01	0.40	-0.13	0.23
	0.16	0.07	-0.04	0.08	0.53						
39	-0.01	0.05	0.09	-0.08	0.02	0.31	0.12	-0.08	0.11	-0.03	0.15
	0.00	-0.02	0.20	0.36	-0.04	-0.06	0.16	0.02	-0.11	-0.06	0.09
	0.26	0.00	0.18	0.12	-0.04	0.16	0.21	-0.06	0.28	-0.05	0.15
	0.11	0.15	0.12	0.27	0.31	0.45					
40	0.12	0.10	0.13	0.20	0.16	0.05	0.05	0.00	0.22	0.16	0.37
	0.11	0.23	0.05	0.19	0.14	0.34	0.39	0.31	0.21	0.19	0.21
	0.15	-0.05	-0.03	0.21	0.22	0.18	0.31	0.31	-0.03	0.17	0.15
	0.21	0.39	0.20	0.21	-0.05	0.19	0.47				
41	-0.01	0.21	0.14	0.17	0.30	0.04	0.04	0.05	0.28	-0.18	0.00
	0.09	0.28	0.14	0.02	-0.02	0.15	0.17	0.29	0.27	-0.09	0.12
	0.21	-0.30	-0.10	0.21	0.12	0.23	0.19	0.36	0.18	0.08	0.14
	0.26	0.19	-0.01	-0.03	0.04	-0.05	0.11	0.39			
42	0.08	0.19	0.15	0.36	0.50	0.01	0.04	-0.05	0.25	-0.02	0.19
	0.01	0.30	0.09	0.02	0.22	0.42	0.33	0.47	0.48	0.12	0.35
	0.32	-0.20	-0.03	0.40	0.34	0.29	0.32	0.66	0.01	0.16	0.26
	0.42	0.34	0.14	0.00	-0.06	-0.11	0.29	0.40	0.70		

43	0.19	0.20	0.17	0.42	0.50	0.02	-0.02	0.01	0.28	0.06	0.07
	0.02	0.27	0.13	0.01	0.23	0.43	0.21	0.50	0.49	0.21	0.35
	0.34	-0.19	-0.02	0.40	0.36	0.33	0.32	0.62	0.09	0.29	0.25
	0.43	0.32	0.21	0.02	-0.02	-0.08	0.25	0.37	0.62	0.64	
44	0.04	-0.08	-0.04	0.24	0.31	-0.03	-0.03	-0.13	-0.09	0.11	0.14
	-0.18	0.01	-0.12	-0.14	0.36	0.28	0.08	0.15	0.24	0.20	0.23
	0.14	0.14	0.18	0.18	0.31	0.11	0.06	0.31	-0.09	0.20	0.20
	0.26	0.09	0.08	-0.06	-0.01	-0.14	0.05	0.03	0.31	0.32	0.46
45	-0.08	0.05	0.04	-0.03	0.15	0.28	0.13	-0.05	0.15	-0.15	0.12
	0.01	0.08	0.16	0.27	-0.01	-0.02	0.20	0.07	-0.01	-0.15	0.11
	0.32	-0.07	0.22	0.17	0.06	0.26	0.22	0.08	0.38	-0.02	0.24
	0.23	0.18	0.03	0.17	0.40	0.38	0.14	0.10	0.03	0.05	-0.04
	0.43										
46	0.27	0.18	0.14	0.36	0.29	-0.04	-0.07	0.16	0.29	0.14	-0.09
	0.15	0.24	0.12	0.01	0.10	0.32	0.06	0.40	0.37	0.22	0.21
	0.21	-0.18	-0.10	0.24	0.28	0.28	0.25	0.40	0.13	0.34	0.11
	0.27	0.25	0.20	0.04	-0.02	-0.04	0.18	0.27	0.35	0.46	0.14
	0.04	0.47									
47	0.07	0.21	0.22	0.35	0.38	0.10	0.21	0.14	0.13	-0.01	0.21
	0.18	0.37	0.12	0.13	0.22	0.38	0.16	0.23	0.29	0.13	0.22
	0.13	0.00	0.09	0.21	0.36	0.22	0.21	0.34	0.04	0.30	0.30
	0.22	0.23	0.05	0.16	0.00	0.00	0.24	0.20	0.34	0.36	0.21
	0.08	0.29	0.42								
48	0.14	0.15	0.18	0.35	0.31	0.07	-0.05	0.04	0.22	0.11	0.07
	0.03	0.19	0.05	0.04	0.24	0.31	0.04	0.27	0.24	0.23	0.12
	0.13	-0.08	[illegible]	0.13	0.29	0.23	0.14	0.24	0.18	0.51	0.17
	0.31	0.17	0.13	0.09	0.01	0.04	0.17	0.17	0.21	0.38	0.23
	0.12	0.41	0.36	0.65							
49	0.16	0.06	0.03	0.19	0.26	0.16	0.09	0.14	0.14	0.01	-0.09
	0.12	0.15	0.17	0.22	0.07	0.15	0.05	0.20	0.20	0.03	0.26
	0.38	-0.01	0.22	0.28	0.26	0.34	0.28	0.26	0.31	0.10	0.26
	0.24	0.20	0.14	0.13	0.36	0.20	0.08	0.13	0.16	0.26	0.11
	0.28	0.26	0.19	0.22	0.45						
50	0.10	0.06	0.08	0.21	0.22	0.05	-0.01	-0.01	0.28	0.12	0.32
	0.07	0.23	0.02	0.12	0.16	0.33	0.41	0.35	0.25	0.15	0.20
	0.23	-0.11	0.00	0.23	0.27	0.28	0.32	0.35	0.11	0.25	0.18
	0.34	0.41	0.18	0.16	0.07	0.22	0.44	0.19	0.32	0.33	0.10
	0.24	0.27	0.27	0.32	0.18	0.50					
51	0.06	0.18	0.23	0.26	0.28	0.16	-0.02	-0.06	0.23	0.05	0.15
	-0.03	0.15	0.10	0.02	0.20	0.24	0.09	0.23	0.15	0.17	0.07
	0.13	-0.12	0.02	0.11	0.19	0.19	0.13	0.17	0.21	0.46	0.17
	0.30	0.15	0.11	0.14	0.01	0.13	0.20	0.16	0.16	0.30	0.15
	0.18	0.32	0.32	0.61	0.15	0.34	0.63				
52	0.11	0.28	0.25	0.27	0.31	0.11	0.06	0.09	0.34	-0.03	0.09
	0.16	0.31	0.22	0.16	0.03	0.26	0.21	0.37	0.28	0.07	0.18
	0.24	-0.26	-0.09	0.26	0.18	0.27	0.29	0.37	0.19	0.22	0.18
	0.28	0.29	0.13	0.14	0.01	0.10	0.28	0.33	0.36	0.40	0.01
	0.16	0.36	0.29	0.32	0.19	0.34	0.32	0.42			
53	0.25	0.09	0.06	0.40	0.34	-0.14	-0.07	0.11	0.25	0.20	0.11
	0.11	0.29	-0.02	-0.04	0.23	0.48	0.26	0.47	0.48	0.28	0.31
	0.22	-0.11	-0.08	0.31	0.41	0.28	0.31	0.57	-0.05	0.30	0.16
	0.33	0.37	0.22	0.01	-0.09	-0.11	0.32	0.27	0.54	0.55	0.28
	-0.02	0.44	0.34	0.31	0.21	0.36	0.21	0.34	0.58		

54	0.18	-0.05	-0.02	0.25	0.21	-0.01	-0.04	0.05	0.12	0.21	0.16
	0.04	0.14	-0.06	0.04	0.25	0.33	0.20	0.25	0.25	0.23	0.23
	0.21	0.07	0.13	0.20	0.36	0.25	0.24	0.30	0.07	0.28	0.19
	0.28	0.29	0.18	0.10	0.12	0.12	0.26	0.05	0.22	0.30	0.25
	0.16	0.27	0.26	0.34	0.27	0.34	0.28	0.18	0.34	0.39	
55	0.16	-0.05	-0.03	0.24	0.20	0.02	-0.01	0.10	0.14	0.17	0.14
	0.08	0.17	-0.06	0.05	0.23	0.31	0.18	0.21	0.22	0.18	0.19
	0.20	0.07	0.16	0.16	0.37	0.28	0.23	0.24	0.16	0.33	0.21
	0.28	0.28	0.14	0.12	0.21	0.17	0.24	0.05	0.15	0.26	0.21
	0.23	0.29	0.28	0.42	0.33	0.36	0.36	0.20	0.30	0.42	0.49

Appendix B
Matrix Reproduced from Table 2 Structure

1	0.36										
2	0.02	0.24									
3	-0.02	0.22	0.24								
4	0.18	0.12	0.13	0.35							
5	-0.02	0.21	0.25	0.33	0.58						
6	-0.08	0.18	0.20	0.00	0.24	0.36					
7	-0.09	0.16	0.19	0.03	0.19	0.25	0.36				
8	0.23	0.12	0.10	0.17	-0.05	-0.08	0.18	0.62			
9	0.21	0.23	0.18	0.15	0.08	0.07	0.00	0.13	0.52		
10	0.29	-0.14	-0.17	0.11	-0.14	-0.21	-0.20	0.10	0.05	0.37	
11	-0.13	-0.03	0.00	0.03	0.11	0.06	0.14	-0.12	0.02	0.00	0.55
12	0.11	0.14	0.12	0.13	0.01	0.02	0.18	0.43	0.14	0.01	0.02
	0.36										
13	-0.01	0.21	0.20	0.24	0.26	0.04	0.22	0.28	0.19	-0.09	0.21
	0.32	0.49									
14	0.00	0.24	0.23	0.08	0.25	0.29	0.21	0.06	0.16	-0.19	-0.09
	0.09	0.13	0.34								
15	0.03	0.21	0.20	0.04	0.20	0.33	0.32	0.13	0.14	-0.14	0.08
	0.15	0.16	0.31	0.42							
16	0.10	-0.06	0.00	0.19	0.19	-0.02	0.00	-0.04	0.00	0.16	0.21
	-0.08	0.00	-0.12	-0.05	0.41						
17	0.14	0.05	0.05	0.35	0.30	-0.10	-0.01	0.11	0.10	0.16	0.22
	0.13	0.31	-0.05	-0.03	0.23	0.48					
18	-0.03	0.03	0.01	0.06	0.12	0.02	0.07	-0.10	0.21	0.03	0.51
	0.04	0.25	-0.06	0.10	0.15	0.26	0.63				
19	0.22	0.14	0.09	0.31	0.29	-0.02	-0.09	0.02	0.34	0.14	0.06
	0.05	0.21	0.08	0.03	0.12	0.34	0.25	0.48			
20	0.23	0.11	0.08	0.33	0.29	-0.06	-0.02	0.14	0.25	0.16	0.08
	0.11	0.23	0.03	0.02	0.21	0.37	0.22	0.41	0.42		
21	0.15	-0.08	-0.09	0.20	0.09	-0.16	-0.19	-0.01	-0.04	0.23	-0.01
	-0.03	0.02	-0.11	-0.16	0.12	0.28	-0.01	0.20	0.18	0.33	
22	0.07	0.08	0.07	0.25	0.41	0.13	0.08	-0.06	-0.02	0.01	0.08
	-0.01	0.15	0.16	0.16	0.09	0.28	0.13	0.27	0.24	0.19	0.45
23	0.11	0.18	0.16	0.18	0.39	0.30	0.13	-0.12	0.18	-0.05	0.04
	-0.06	0.06	0.30	0.31	0.07	0.11	0.13	0.28	0.20	0.03	0.38
	0.53										
24	0.02	-0.19	-0.14	-0.02	-0.08	-0.04	0.09	0.10	-0.35	0.13	0.10
	0.02	-0.08	-0.13	0.01	0.13	0.03	-0.08	-0.23	-0.11	0.08	0.05
	-0.09	0.45									
25	-0.02	0.01	0.06	0.01	0.18	0.24	0.22	-0.05	-0.11	-0.06	0.13
	-0.05	-0.04	0.12	0.24	0.16	-0.03	0.03	-0.09	-0.04	-0.07	0.14
	0.22	0.20	0.33								
26	0.09	0.17	0.15	0.24	0.42	0.20	0.11	-0.04	0.14	-0.04	0.06
	0.01	0.17	0.24	0.23	0.07	0.22	0.17	0.32	0.27	0.09	0.41
	0.44	-0.09	0.14	0.43							
27	0.10	0.03	0.05	0.33	0.32	-0.04	0.05	0.11	0.01	0.13	0.22
	0.11	0.28	-0.02	0.01	0.24	0.43	0.20	0.26	0.31	0.25	0.30
	0.13	0.11	0.05	0.22	0.42						

28	0.08	0.16	0.15	0.23	0.34	0.16	0.09	0.00	0.16	-0.01	0.09
	0.05	0.20	0.19	0.19	0.07	0.23	0.15	0.27	0.23	0.10	0.30
	0.32	-0.08	0.09	0.32	0.22	0.27					
29	0.13	0.17	0.14	0.23	0.32	0.15	0.10	0.03	0.21	0.02	0.12
	0.08	0.22	0.19	0.22	0.07	0.25	0.22	0.32	0.26	0.10	0.31
	0.35	-0.08	0.08	0.34	0.23	0.29	0.32				
30	0.16	0.14	0.12	0.39	0.48	0.00	-0.01	0.00	0.20	0.07	0.12
	0.04	0.28	0.10	0.05	0.20	0.45	0.28	0.51	0.48	0.23	0.43
	0.35	-0.15	-0.01	0.44	0.40	0.34	0.37	0.67			
31	-0.02	0.20	0.20	0.03	0.20	0.30	0.14	-0.07	0.18	-0.17	-0.03
	-0.01	0.04	0.29	0.26	-0.06	-0.08	-0.01	0.07	-0.01	-0.11	0.09
	0.28	-0.16	0.13	0.18	-0.06	0.16	0.16	0.04	0.30		
32	0.14	0.04	0.06	0.29	0.17	-0.08	-0.10	0.07	0.11	0.18	0.05
	0.06	0.16	-0.04	-0.11	0.18	0.33	0.00	0.22	0.21	0.29	0.11
	0.01	0.00	-0.07	0.05	0.29	0.14	0.12	0.21	-0.01	0.45	
33	-0.04	0.16	0.19	0.18	0.39	0.26	0.24	-0.01	0.04	-0.13	0.18
	0.05	0.22	0.22	0.27	0.11	0.18	0.15	0.13	0.13	0.01	0.30
	0.32	0.03	0.22	0.30	0.22	0.26	0.25	0.26	0.19	0.07	0.34
34	0.08	0.12	0.12	0.22	0.35	0.14	0.00	-0.19	0.23	0.03	0.19
	-0.11	0.10	0.10	0.09	0.24	0.24	[illegible]	0.34	0.28	0.10	0.25
	0.34	-0.16	0.10	0.30	0.21	0.26	[illegible]	0.39	0.16	0.17	0.22
	0.41										
35	0.14	0.09	0.05	0.22	0.21	0.02	0.04	0.05	0.23	0.12	0.28
	0.12	0.27	0.04	0.12	0.12	0.34	0.39	0.34	0.30	0.14	0.25
	0.22	-0.05	0.01	0.26	0.29	0.24	0.30	0.38	0.03	0.16	0.18
	0.26	0.39									
36	0.38	0.03	-0.03	0.13	0.01	0.03	-0.11	0.05	0.30	0.30	-0.05
	-0.01	-0.10	0.07	0.13	0.10	0.09	0.10	0.29	0.23	0.14	0.15
	0.30	-0.04	0.05	0.20	0.06	0.16	0.23	0.19	0.10	0.08	0.02
	0.22	0.22	0.56								
37	0.00	0.12	0.13	0.07	0.16	0.22	0.20	0.05	0.05	-0.07	0.12
	0.10	0.15	0.19	0.26	-0.01	0.06	0.08	0.03	0.01	-0.02	0.16
	0.21	0.06	0.17	0.16	0.09	0.16	0.17	0.04	0.17	0.04	0.22
	0.08	0.12	0.07	0.22							
38	-0.03	0.11	0.12	-0.02	0.15	0.28	0.22	-0.04	0.02	-0.12	0.07
	-0.01	0.01	0.22	0.30	0.00	-0.08	0.04	-0.03	-0.05	-0.13	0.13
	0.26	0.05	0.24	0.17	-0.03	0.12	0.13	-0.01	0.21	-0.11	0.21
	0.09	0.04	0.08	0.19	0.25						
39	-0.04	0.10	0.09	-0.05	0.08	0.28	0.14	-0.13	0.09	-0.08	0.15
	-0.02	0.04	0.21	0.29	-0.10	-0.05	0.13	0.01	-0.10	-0.05	0.14
	0.27	0.00	0.17	0.16	-0.02	0.16	0.18	-0.04	0.25	-0.02	0.20
	0.12	0.13	0.15	0.25	0.24	0.41					
40	0.12	0.08	0.05	0.19	0.16	0.02	0.04	0.04	0.24	0.12	0.31
	0.11	0.26	0.01	0.10	0.14	0.31	0.40	0.30	0.26	0.12	0.18
	0.17	-0.05	0.01	0.19	0.26	0.21	0.26	0.30	0.03	0.18	0.16
	0.25	0.36	0.20	0.12	0.03	0.14	0.36				
41	-0.01	0.23	0.22	0.20	0.31	0.08	0.07	0.04	0.27	-0.15	0.01
	0.09	0.26	0.17	0.07	0.02	0.17	0.14	0.29	0.25	-0.03	0.12
	0.16	-0.32	-0.09	0.22	0.11	0.18	0.18	0.35	0.13	0.07	0.14
	0.22	0.15	-0.03	0.00	-0.01	-0.06	0.11	0.40			
42	0.10	0.16	0.14	0.35	0.46	0.00	0.01	-0.02	0.26	0.02	0.17
	0.04	0.29	0.07	0.02	0.23	0.41	0.35	0.49	0.48	0.14	0.33
	0.30	-0.24	-0.03	0.39	0.34	0.29	0.32	0.64	0.04	0.15	0.22
	0.40	0.35	0.13	-0.01	-0.03	-0.10	0.29	0.42	0.69		

43	0.17	0.18	0.16	0.42	0.49	0.01	-0.05	0.00	0.26	0.07	0.05
	0.03	0.27	0.11	0.01	0.22	0.44	0.19	0.51	0.47	0.24	0.37
	0.32	-0.22	-0.05	0.40	0.37	0.33	0.34	0.63	0.08	0.30	0.23
	0.40	0.32	0.18	0.02	-0.04	-0.06	0.26	0.38	0.62	0.66	
44	0.16	-0.06	0.02	0.23	0.27	0.01	0.03	-0.01	-0.01	0.16	0.14
	-0.12	-0.08	-0.11	-0.04	0.55	0.20	0.09	0.14	0.29	0.07	0.10
	0.12	0.13	0.24	0.12	0.23	0.06	0.05	0.26	-0.06	0.12	0.12
	0.29	0.06	0.14	-0.07	0.03	-0.24	0.07	0.07	0.34	0.29	0.86
45	-0.03	0.16	0.17	0.03	0.20	0.30	0.21	-0.06	0.15	-0.13	0.16
	0.02	0.10	0.23	0.30	0.02	-0.01	0.16	0.06	0.01	-0.11	0.13
	0.28	-0.05	0.20	0.19	0.02	0.18	0.19	0.05	0.25	-0.03	0.24
	0.18	0.12	0.10	0.22	0.24	0.29	0.13	0.08	0.05	0.05	0.00
	0.29										
46	0.20	0.17	0.15	0.37	0.31	-0.03	-0.06	0.13	0.25	0.11	-0.06
	0.12	0.25	0.11	0.00	0.10	0.36	0.02	0.39	0.35	0.26	0.24
	0.19	-0.16	-0.10	0.25	0.30	0.25	0.25	0.42	0.07	0.37	0.14
	0.24	0.23	0.17	0.05	-0.07	-0.02	0.20	0.25	0.36	0.48	0.09
	0.01	0.47									
47	0.06	0.18	0.22	0.34	0.39	0.11	0.21	0.21	0.13	-0.01	0.19
	0.19	0.35	0.12	0.15	0.25	0.35	0.15	0.22	0.29	0.08	0.21
	0.15	0.02	0.12	0.21	0.35	0.23	0.22	0.33	0.08	0.27	0.28
	0.23	0.22	-0.01	0.14	0.06	-0.01	0.22	0.23	0.34	0.36	0.31
	0.13	0.29	0.47								
48	0.14	0.14	0.18	0.33	0.27	0.06	-0.04	0.03	0.25	0.12	0.08
	0.04	0.18	0.07	0.00	0.24	0.31	0.02	0.27	0.24	0.23	0.11
	0.13	-0.10	0.00	0.11	0.28	0.22	0.18	0.24	0.13	0.49	0.16
	0.30	0.17	0.15	0.11	-0.02	0.07	0.21	0.15	0.21	0.37	0.22
	0.11	0.41	0.36	0.64							
49	0.14	0.16	0.16	0.21	0.31	0.21	0.13	0.06	0.13	0.01	0.00
	0.06	0.13	0.24	0.25	0.06	0.15	0.02	0.20	0.17	0.08	0.29
	0.35	0.00	0.16	0.31	0.17	0.26	0.27	0.25	0.20	0.12	0.26
	0.21	0.17	0.22	0.20	0.18	0.19	0.14	0.11	0.18	0.25	0.09
	0.20	0.22	0.21	0.21	0.31						
50	0.10	0.12	0.10	0.23	0.23	0.07	0.03	-0.04	0.30	0.10	0.35
	0.07	0.27	0.04	0.11	0.19	0.34	0.42	0.34	0.28	0.13	0.19
	0.22	-0.11	0.02	0.22	0.28	0.25	0.29	0.34	0.10	0.25	0.20
	0.34	0.38	0.21	0.14	0.05	0.18	0.40	0.17	0.34	0.33	0.11
	0.19	0.26	0.27	0.35	0.17	0.47					
51	0.08	0.16	0.20	0.25	0.25	0.14	0.01	-0.04	0.26	0.05	0.14
	0.01	0.16	0.10	0.06	0.22	0.23	0.07	0.21	0.16	0.14	0.06
	0.14	-0.12	0.05	0.09	0.21	0.20	0.17	0.16	0.19	0.42	0.18
	0.31	0.16	0.12	0.14	0.04	0.15	0.21	0.14	0.15	0.29	0.18
	0.18	0.33	0.33	0.60	0.19	0.36	0.61				
52	0.08	0.26	0.24	0.28	0.33	0.11	0.07	0.09	0.35	-0.05	0.07
	0.15	0.33	0.20	0.14	0.04	0.27	0.18	0.36	0.29	0.07	0.18
	0.23	-0.27	-0.06	0.26	0.21	0.27	0.28	0.37	0.18	0.23	0.21
	0.28	0.26	0.10	0.12	0.03	0.09	0.24	0.34	0.38	0.42	0.02
	0.15	0.37	0.31	0.35	0.21	0.32	0.33	0.43			
53	0.23	0.09	0.07	0.40	0.35	-0.11	-0.08	0.10	0.22	0.19	0.11
	0.10	0.28	-0.01	-0.05	0.23	0.48	0.24	0.48	0.47	0.30	0.31
	0.20	-0.10	-0.09	0.30	0.41	0.27	0.30	0.58	-0.04	0.33	0.15
	0.32	0.36	0.21	0.01	-0.10	-0.10	0.31	0.27	0.54	0.57	0.26
	-0.02	0.45	0.33	0.33	0.19	0.35	0.23	0.34	0.58		

54	0.12	0.00	0.00	0.28	0.27	0.01	-0.05	-0.07	0.01	0.19	0.18
	-0.02	0.14	0.00	0.01	0.19	0.38	0.15	0.26	0.23	0.33	0.34
	0.22	0.12	0.07	0.24	0.37	0.25	0.25	0.34	0.01	0.35	0.21
	0.25	0.28	0.18	0.14	0.01	0.14	0.26	0.00	0.22	0.33	0.11
	0.07	0.31	0.23	0.36	0.22	0.32	0.31	0.18	0.36	0.49	
55	0.16	0.05	0.06	0.25	0.22	0.07	0.00	-0.01	0.13	0.18	0.22
	0.03	0.16	0.04	0.09	0.21	0.33	0.18	0.24	0.20	0.25	0.24
	0.21	0.08	0.10	0.19	0.31	0.24	0.25	0.24	0.08	0.36	0.21
	0.27	0.28	0.24	0.18	0.06	0.20	0.30	0.00	0.15	0.26	0.13
	0.15	0.28	0.26	0.43	0.24	0.37	0.41	0.22	0.30	0.44	0.47

Appendix C
Residual Matrix

1	-0.01										
2	0.02	0.18									
3	0.06	0.19	0.20								
4	0.04	0.07	0.07	0.04							
5	0.04	0.07	0.04	0.02	-0.01						
6	-0.01	0.09	0.12	0.02	0.02	0.12					
7	-0.04	0.08	0.05	0.03	0.02	0.03	0.07				
8	-0.08	-0.06	-0.11	-0.05	0.00	-0.06	-0.07	-0.18			
9	-0.09	-0.06	-0.04	0.00	0.07	-0.04	-0.05	-0.07	-0.18		
10	0.03	0.00	0.08	0.03	0.02	0.02	-0.05	-0.08	-0.05	0.09	
11	-0.03	0.04	0.08	0.03	0.04	0.04	0.04	-0.03	-0.02	0.00	0.02
12	0.00	0.01	-0.04	-0.01	-0.02	-0.04	0.01	-0.03	-0.03	-0.04	-0.05
	0.06										
13	0.02	0.02	-0.03	0.01	0.00	-0.03	0.05	0.02	0.00	-0.05	-0.04
	0.05	0.03									
14	0.06	0.15	0.16	0.05	0.02	0.11	0.04	-0.05	-0.02	0.05	0.02
	0.00	-0.02	0.16								
15	0.01	0.08	0.10	0.02	-0.01	0.08	0.02	-0.08	-0.06	0.04	0.03
	0.00	-0.02	0.12	0.12							
16	-0.05	0.02	0.02	0.03	0.06	0.03	0.01	-0.07	-0.07	-0.01	0.01
	-0.05	0.03	0.03	-0.01	-0.08						
17	0.05	0.05	0.06	0.03	0.02	0.03	0.07	0.00	0.03	0.02	0.03
	0.01	0.00	0.03	0.06	0.05	0.01					
18	-0.04	-0.06	-0.04	0.00	0.03	-0.02	-0.03	0.02	-0.03	-0.05	-0.09
	-0.02	-0.04	-0.03	-0.02	-0.04	-0.01	-0.13				
19	0.02	0.02	0.05	0.01	0.02	0.02	-0.01	-0.01	-0.02	0.02	-0.01
	-0.01	-0.03	0.05	0.04	-0.01	-0.01	-0.03	0.00			
20	-0.05	-0.01	-0.02	0.01	0.05	-0.03	0.00	-0.04	-0.05	-0.06	-0.03
	-0.02	0.03	-0.01	-0.05	-0.04	0.01	-0.03	-0.02	-0.01		
21	0.14	0.08	0.15	0.05	-0.02	0.06	0.04	0.01	0.07	0.16	0.06
	0.00	-0.07	0.07	0.12	0.10	0.00	0.01	0.03	0.00	0.08	
22	0.09	0.04	0.07	0.01	-0.05	0.03	0.03	0.04	0.10	0.07	0.03
	0.02	-0.03	0.03	0.07	0.10	-0.01	0.02	0.02	0.03	-0.02	-0.09
23	-0.02	-0.05	-0.04	-0.02	-0.02	-0.01	-0.06	0.01	0.01	0.00	-0.03
	-0.02	-0.02	-0.02	-0.02	0.01	0.00	0.03	0.03	0.01	-0.02	-0.04
	0.01										
24	-0.01	0.02	0.03	0.00	0.00	0.03	0.00	-0.08	0.06	0.00	0.01
	-0.05	-0.02	0.01	0.00	0.03	0.00	0.00	0.02	0.00	0.02	-0.03
	-0.02	-0.10									
25	-0.07	-0.05	-0.06	0.00	0.01	0.01	0.00	-0.02	-0.04	-0.04	-0.02
	-0.03	0.03	-0.03	-0.04	0.00	0.04	-0.02	-0.02	0.00	0.01	0.02
	-0.01	0.01	0.06								
26	0.04	0.02	0.03	0.01	-0.03	0.01	-0.01	0.00	0.03	0.05	0.01
	-0.01	-0.03	0.01	0.02	0.06	0.01	0.00	0.02	0.01	0.01	-0.05
	-0.03	0.00	-0.01	-0.04							
27	0.03	-0.04	-0.07	0.00	-0.02	-0.03	0.03	0.06	0.05	-0.02	-0.04
	0.03	0.02	-0.06	-0.01	0.04	-0.01	0.00	-0.03	0.03	-0.07	-0.04
	0.01	-0.01	0.08	-0.02	0.04						

28	0.02	-0.06	-0.09	-0.03	-0.05	-0.04	-0.04	0.08	0.06	-0.02	-0.06
	0.04	0.01	-0.05	-0.02	0.00	-0.03	0.03	0.01	0.03	-0.08	-0.06
	0.02	-0.04	0.02	-0.03	0.03	0.06					
29	0.04	-0.02	0.00	-0.01	-0.04	0.00	-0.02	0.02	0.02	0.04	-0.01
	0.02	-0.02	0.01	0.05	0.01	0.00	0.02	0.02	-0.01	0.01	-0.01
	0.00	-0.01	-0.02	-0.01	-0.01	0.01	0.04				
30	0.01	0.00	-0.01	-0.01	0.00	-0.01	0.02	0.01	0.05	-0.02	0.03
	0.00	0.01	-0.01	0.01	0.02	-0.01	0.03	-0.01	0.02	-0.06	-0.04
	0.02	-0.01	0.02	-0.02	-0.01	0.00	0.00	-0.01			
31	-0.02	-0.08	-0.12	-0.05	-0.03	-0.02	-0.08	0.06	0.01	-0.05	-0.10
	0.02	0.00	-0.05	-0.05	-0.04	-0.04	0.02	0.01	0.01	-0.08	-0.04
	0.05	-0.02	0.02	-0.03	0.04	0.10	0.01	0.01	0.18		
32	0.04	0.05	0.06	0.03	0.02	0.03	0.03	0.01	0.02	0.02	0.03
	0.00	0.00	0.01	0.01	0.04	-0.01	0.03	-0.01	0.01	-0.01	-0.03
	-0.02	-0.01	0.02	0.00	-0.02	-0.03	-0.04	-0.03	0.01	0.01	
33	-0.01	0.01	0.00	0.02	0.01	0.02	0.05	0.01	0.00	-0.02	0.03
	0.00	0.02	-0.01	0.00	0.07	0.03	0.01	-0.01	0.03	-0.03	-0.03
	-0.03	0.02	0.06	-0.03	0.04	-0.02	-0.03	0.01	-0.02	0.00	0.05
34	-0.05	-0.07	-0.07	-0.01	0.02	-0.04	-0.05	0.04	-0.02	-0.04	-0.04
	-0.02	0.01	-0.05	-0.07	-0.04	0.00	0.00	0.00	0.01	-0.03	0.00
	0.03	0.01	0.00	0.00	0.03	0.04	-0.01	0.04	0.05	0.00	0.01
	0.03										
35	0.00	-0.04	-0.02	-0.01	-0.01	-0.03	-0.03	0.02	0.01	-0.01	-0.04
	0.01	-0.02	-0.03	0.01	-0.01	-0.01	-0.02	0.00	-0.02	-0.01	-0.02
	0.01	-0.04	-0.02	-0.01	-0.01	0.03	0.03	0.01	0.02	-0.02	-0.02
	0.01	0.02									
36	-0.10	0.04	0.15	0.05	0.10	0.04	0.00	-0.11	-0.17	-0.01	0.04
	-0.04	0.01	0.08	0.02	-0.01	0.06	-0.07	-0.01	-0.08	0.15	0.08
	-0.07	0.03	-0.07	0.02	0.01	-0.04	0.00	0.01	-0.08	0.04	0.01
	-0.08	-0.06	-0.21								
37	0.06	0.09	0.13	0.04	-0.02	0.07	0.03	-0.03	0.01	0.08	0.05
	0.01	-0.03	0.08	0.11	0.06	0.04	-0.01	0.04	-0.02	0.09	0.00
	-0.06	-0.01	-0.03	-0.01	-0.04	-0.06	0.02	-0.02	-0.08	0.02	-0.02
	-0.06	0.00	0.07	0.09							
38	-0.05	-0.17	-0.22	-0.07	-0.05	-0.06	-0.09	0.06	0.00	-0.07	-0.12
	0.02	0.01	-0.11	-0.07	-0.04	-0.03	0.02	-0.02	0.01	-0.10	-0.02
	0.07	-0.02	0.08	-0.03	0.10	0.13	0.02	0.02	0.19	-0.02	0.02
	0.07	0.03	-0.12	-0.11	0.28						
39	0.03	-0.05	0.01	-0.03	-0.06	0.03	-0.02	0.06	0.01	0.05	0.00
	0.02	-0.06	-0.01	0.07	0.06	-0.02	0.02	0.01	-0.02	-0.01	-0.05
	-0.02	0.00	0.02	-0.04	-0.02	0.00	0.03	-0.02	0.04	-0.04	-0.04
	-0.01	0.02	-0.02	0.01	0.07	0.03					
40	0.00	0.02	0.08	0.01	0.00	0.03	0.01	-0.04	-0.02	0.03	0.05
	0.00	-0.03	0.04	0.08	-0.01	0.02	-0.01	0.01	-0.05	0.07	0.03
	-0.02	0.00	-0.05	0.02	-0.04	-0.02	0.05	0.01	-0.06	-0.01	-0.01
	-0.03	0.03	0.00	0.09	-0.08	0.06	0.11				
41	0.00	-0.02	-0.08	-0.02	-0.02	-0.04	-0.03	0.00	0.01	-0.03	-0.01
	0.00	0.01	-0.03	-0.05	-0.04	-0.01	0.03	0.00	0.02	-0.05	0.00
	0.04	0.02	-0.01	-0.01	0.01	0.05	0.00	0.02	0.05	0.01	0.00
	0.04	0.04	0.02	-0.03	0.04	0.01	0.00	-0.01			
42	-0.03	0.03	0.01	0.01	0.04	0.01	0.03	-0.03	-0.02	-0.04	0.03
	-0.03	0.01	0.02	-0.01	-0.02	0.01	-0.02	-0.02	0.00	-0.01	0.02
	0.03	0.04	0.01	0.01	-0.01	0.00	-0.01	0.01	-0.03	0.00	0.04
	0.01	-0.01	0.01	0.00	-0.03	-0.01	-0.01	-0.01	0.00		

43	0.02	0.02	0.01	0.00	0.01	0.01	0.03	0.01	0.02	-0.01	0.02
	-0.01	0.01	0.01	0.01	0.02	-0.01	0.02	-0.01	0.01	-0.04	-0.02
	0.03	0.03	0.03	0.00	-0.01	0.00	-0.01	-0.01	0.01	-0.02	0.02
	0.02	0.00	0.03	-0.01	0.02	-0.02	-0.02	-0.01	0.00	-0.02	
44	-0.12	-0.02	-0.06	0.00	0.04	-0.04	-0.06	-0.12	-0.08	-0.05	0.01
	-0.06	0.09	0.00	-0.10	-0.19	0.08	-0.01	0.01	-0.04	0.13	0.13
	0.02	0.01	-0.06	0.06	0.08	0.04	0.01	0.05	-0.03	0.08	0.08
	-0.03	0.02	-0.06	0.02	-0.03	0.10	-0.02	-0.04	-0.03	0.04	-0.40
45	-0.04	-0.12	-0.13	-0.06	-0.05	-0.02	-0.08	0.01	0.00	-0.02	-0.04
	-0.01	-0.02	-0.07	-0.03	-0.03	-0.01	0.04	0.01	-0.01	-0.04	-0.01
	0.04	-0.02	0.02	-0.02	0.04	0.08	0.03	0.02	0.12	0.00	-0.01
	0.05	0.05	-0.07	-0.04	0.16	0.09	0.01	0.02	-0.02	0.01	-0.04
	0.13										
46	0.06	0.01	0.00	0.00	-0.02	-0.01	-0.01	0.03	0.04	0.02	-0.03
	0.03	-0.01	0.01	0.01	0.01	-0.03	0.04	0.01	0.02	-0.04	-0.04
	0.02	-0.02	0.01	0.00	-0.02	0.02	0.00	-0.02	0.06	-0.03	-0.03
	0.03	0.01	0.03	-0.01	0.05	-0.02	-0.02	0.02	-0.01	-0.02	0.05
	0.03	0.00									
47	0.01	0.04	0.00	0.01	-0.01	-0.01	0.00	-0.07	0.00	0.00	0.02
	-0.01	0.02	0.00	-0.02	-0.03	0.04	0.02	0.02	0.00	0.04	0.02
	-0.02	-0.02	-0.03	0.00	0.01	-0.01	-0.01	0.01	-0.04	0.04	0.02
	-0.01	0.01	0.06	0.02	-0.06	0.01	0.02	-0.03	0.00	0.01	-0.10
	-0.04	0.00	-0.05								
48	0.00	0.01	0.00	0.02	0.03	0.01	-0.01	0.01	-0.03	-0.01	-0.01
	-0.01	0.01	-0.02	-0.04	-0.01	0.00	0.02	0.00	0.01	0.00	0.01
	0.00	0.01	0.02	0.02	0.01	0.01	-0.04	0.00	0.05	0.02	0.01
	0.01	-0.01	-0.02	-0.01	0.02	-0.03	-0.05	0.02	0.00	0.01	0.01
	0.02	0.00	0.01	0.01							
49	0.02	-0.10	-0.13	-0.02	-0.05	-0.06	-0.05	0.08	0.01	0.00	-0.09
	0.05	0.02	-0.07	-0.03	0.01	0.00	0.02	0.00	0.03	-0.05	-0.03
	0.02	0.00	0.06	-0.03	0.08	0.08	0.01	0.00	0.11	-0.02	0.00
	0.03	0.03	-0.07	-0.07	0.18	0.00	-0.05	0.02	-0.02	0.01	0.03
	0.08	0.04	-0.02	0.01	0.14						
50	0.00	-0.05	-0.02	-0.01	-0.02	-0.02	-0.04	0.03	-0.01	0.02	-0.03
	0.01	-0.03	-0.03	0.01	-0.03	-0.01	-0.01	0.00	-0.03	0.02	0.01
	0.01	0.00	-0.03	0.01	-0.01	0.03	0.04	0.02	0.02	-0.01	-0.02
	0.00	0.03	-0.03	0.02	0.02	0.04	0.05	0.02	-0.02	-0.01	-0.01
	0.06	0.01	0.00	-0.03	0.01	0.03					
51	-0.02	0.03	0.04	0.01	0.03	0.03	-0.03	-0.02	-0.04	-0.01	0.01
	-0.03	-0.01	0.00	-0.04	-0.02	0.00	0.02	0.01	-0.01	0.03	0.01
	-0.02	0.00	-0.03	0.02	-0.02	-0.01	-0.04	0.01	0.02	0.04	-0.01
	-0.01	0.00	-0.01	0.00	-0.04	-0.02	-0.01	0.02	0.01	0.01	-0.03
	0.00	0.00	-0.01	0.00	-0.05	-0.02	0.02				
52	0.03	0.02	0.01	-0.01	-0.02	0.00	-0.01	-0.01	-0.01	0.02	0.01
	0.01	-0.02	0.01	0.02	-0.01	-0.01	0.03	0.01	-0.01	0.00	0.00
	0.00	0.01	-0.03	-0.01	-0.03	0.00	0.01	0.00	0.00	-0.01	-0.03
	0.00	0.03	0.03	0.02	-0.02	0.01	0.04	-0.01	-0.02	-0.02	-0.01
	0.00	-0.01	-0.02	-0.03	-0.02	0.02	-0.01	-0.01			
53	0.03	-0.01	-0.01	0.00	0.00	-0.03	0.01	0.01	0.02	0.01	0.00
	0.02	0.01	-0.01	0.01	0.00	-0.01	0.02	-0.01	0.01	-0.02	-0.01
	0.02	0.00	0.01	0.01	0.00	0.01	0.01	-0.01	-0.01	-0.03	0.00
	0.01	0.02	0.01	0.00	0.01	-0.01	0.01	0.00	-0.01	-0.02	0.02
	0.01	-0.01	0.00	-0.02	0.02	0.01	-0.02	-0.01	0.00		

54	0.06	-0.04	-0.03	-0.02	-0.06	-0.01	0.02	0.12	0.11	0.02	-0.02
	0.06	0.00	-0.05	0.03	0.06	-0.05	0.06	-0.01	0.03	-0.10	-0.11
	-0.01	-0.05	0.05	-0.04	-0.02	0.00	-0.01	-0.04	0.06	-0.07	-0.02
	0.03	0.01	0.00	-0.04	0.11	-0.03	0.00	0.05	0.01	-0.03	0.14
	0.09	-0.04	0.02	-0.02	0.05	0.03	-0.03	0.00	-0.02	-0.10	
55	0.00	-0.10	-0.09	-0.01	-0.02	-0.05	-0.02	0.11	0.00	-0.01	-0.08
	0.05	0.01	-0.09	-0.04	0.02	-0.02	0.01	-0.03	0.02	-0.06	-0.05
	-0.01	-0.01	0.06	-0.03	0.06	0.05	-0.02	0.00	0.08	-0.03	0.00
	0.02	0.00	-0.10	-0.07	0.14	-0.03	-0.06	0.05	-0.01	0.00	0.08
	0.08	0.00	0.02	-0.01	0.09	-0.01	-0.05	-0.02	0.00	-0.02	0.03